Hall Ticket Number :										

R-14

Code: 4G251

III B.Tech. I Semester Supplementary Examinations November 2019

Electrical Machines-III

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Compare the salient features of projecting pole rotor and round rotor. 7M

   b) Find the pitch factor for the winding of 36 slots, 4 poles, coil span 1 to 8. 7M

OR

2. a) Explain how the harmonics in the generated EMF can be suppressed in synchronous machines. 6M

   b) A 3-Ph, 50 Hz, 8 pole alternator has a star connected winding with 120 slots and 8 conductors/slot. The flux per pole is 0.05wb, sinusoidally distributed. Determine the phase and line voltages. Let the winding factor as 0.956. 8M

UNIT–II

3. a) Write a short note on armature winding terminology. 7M

   b) A salient pole alternator has d-axis and q-axis reactance of 0.8pu and 0.5pu respectively. The effective resistance is 0.02pu. Compute percentage regulation when the generator is delivering rated load at 08 p.f lead. 7M

OR

4. a) Explain the method of determining Xd and Xq (slip test) of a salient pole synchronous machine. 7M

   b) A 3 ph y connected, 1000KVA, 11KV alternator has rated current of 52.5A. The ac resistance of the winding is 0.45 Ω/ph. The test results are given as

   OC test: I_f = 12.5A, voltage between lines = 422V

   SC test: I_f = 12.5A, line current = 52.5A

   Compute the synchronous reactance per phase. 7M

UNIT–III

5. a) Discuss the need for connecting the alternators in parallel. Mention the conditions for parallel operation of alternators. 7M

   b) Two similar turbo alternators are rated at 25MW each. They are running in parallel. The speed-load curves of the driving turbines are such that the frequency of alternator-1 drops uniformly from 50Hz no load to 48Hz on full load and that alternator-2 from 50Hz to 48.5Hz. How will the two machines share a load of 30MW. 7M

OR

6. Two single phase alternators operate in parallel and supply a load impedance of (3+j4) Ω/ph. If the impedance is (0.2 + j2) Ω/ph, e.m.f.s are (220 + j0)V, determine (i) Terminal voltage, (ii) p.f and output power of each machine. 14M

UNIT–IV

7. a) Name the different starting methods of synchronous motor, explain how the synchronous motor can start with help of damper winding. 7M

   b) State the main features of synchronous motor. Mention its applications. 7M

OR

8. a) Explain why the 3 – Ph synchronous motor is not a self starting motor? 7M

   b) A 3 ph, 6600V, Y connected synchronous motor delivers 500KW power to a load. Its full load efficiency is 83%. Let R_a = 0.3 Ω/ph and X_s = 3.2 Ω/ph. Find the generated e.m.f and load angle when the machine is operating with 0.8 leading p.f. 7M

UNIT–V

9. a) Discuss in detail about the working principle of split phase motor with neat diagram. 7M

   b) Explain in detail about double revolving field theory. 7M

OR

10. Compare the AC series motor with Universal motor and mention their operational difficulties. 14M

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Hall Ticket Number :										

R-14

Code: 4G359

III B.Tech. I Semester Supplementary Examinations November 2019

Linear and Digital Integrated Circuits Applications

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the operation of inverting and non-inverting operational amplifier. 8M

   b) With a neat sketch explain the operation of difference amplifier. 6M

OR

2. Discuss the DC characteristics of an OP amp 14M

UNIT–II

3. a) Explain the various DAC and ADC specifications in detail. 8M

   b) Determine the resolution of 8-bit ADC for 15V input. 6M

OR

4. a) Design a ramp generator using 555 timer having an output frequency of approximately 5 KHz. 8M

   b) Write a detailed note on any two applications of 555 timer in monostable mode. 6M

UNIT–III

5. a) Write a short note on MOS transistors. 6M

   b) Draw the 2-input OR gate using diode logic and explain its operation using truth table. 8M

OR

6. a) Draw the circuit for 2 input TTL NAND gate and explain operation with the help of truth table. 10M

   b) Explain low voltage CMOS logic 4M

UNIT–IV

7. a) Explain the operation of parity circuits. 7M

   b) What is the necessity of tri-state buffers? 7M

OR

8. Examine the function of priority encoder with truth table. And draw pin diagram and logic diagram of IC 74X148 14M

UNIT–V

9. Draw pin and logic diagrams of IC 74X198 and give a detailed operation. 14M

OR

10. Develop a synchronous modulo-16 UP/DOWN counter using J-K Flip flop 14M

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Hall Ticket Number :										

R-14

Code: 4G253

III B.Tech. I Semester Supplementary Examinations November 2019

Power Electronics

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Discuss about switching characteristics of an SCR during turn on and off. 7M

   b) Explain various turn-on methods of an SCR. 7M

OR

2. a) Explain the static V-I characteristics of a thyristors and different modes of operation. 7M

   b) Explain the series and parallel connections of the SCRs? 7M

UNIT–II

3. a) Explain the specifications and ratings of the SCR's and how the protection against the dv/dt taken place with design of the snubber circuit? 7M

   b) For the circuit shown in the Fig.1

   i) Calculate the maximum values of the di/dt and dv/dt of the SCR.

   ii) find the rms and average current ratings of the SCR for the firing angle delays of 90 and 150 degrees

   iii) Suggest the rated voltage of the SCR?

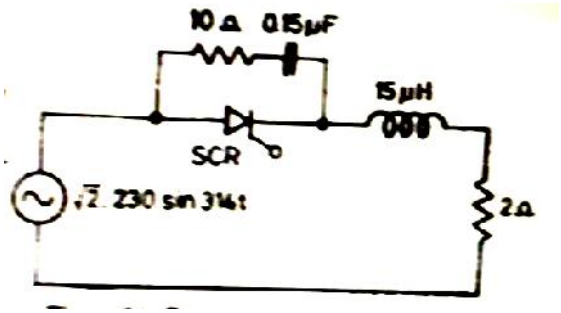

Fig.1 7M

OR

4. a) Explain the over current protection of the circuit by using current limiting fuses? 7M

   b) Write short notes on the cooling and mounting of thyristors? 7M

UNIT–III

5. Describe the working of three phase fully controlled converter and derive the expressions for average output voltage and rms output voltage 14M

OR

6. a) Describe the principle and operation of the six pulse midpoint converter with RL loads? 7M

   b) A single-phase full converter has a RL load having L = 6.5 mH, R = 0.5Ω and E = 10 V. The input voltage is Vs= 120 V at (r.m.s) 60Hz. Determine: (i) The average thyristor current Ia. (ii) r.m.s thyristror current IR.(iii) The average output current Idc. 7M

UNIT–IV

7. a) Explain the principle of operation for buck boost converter under RLE load? 7M

   b) Write short notes on the

   (i) Time ratio control

   (ii) Ripple current

   (iii) Ripple factor 7M

OR

8. a) Discuss the principle of operation of DC-DC step down chopper with suitable waveforms 7M

   b) A step-up chopper has an input voltage of 150V. The voltage output needed is 450V. Given that thyristror has a conducting time of 150 μseconds. Calculate the chopping frequency 7M

UNIT–V

9. a) Describe the operation of single phase full wave AC voltage controller feeding RL load with relevant waveforms. 7M

   b) A single phase AC voltage controller has a resistive load of R=10 ohms and the input voltage is Vs = 120V, 60Hz. The delay angle of thyristor is 90 degrees. Determine:

   (i) The r.m.s value of output voltage V_o

   (ii) The input power factor.

   (iii) The average input current. 7M

OR

10. a) Explain the operation of single phase bridge configuration of cyclo converter with continuous load current. 7M

    b) What are the different PWM techniques employed for inverter? Explain sinusoidal PWM technique with neat wave forms. 7M

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